

NEXUS

NET WORKING

Printer Sharer Software

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About this manual

Versions of RISC OS

This manual assumes you are using RISC OS 3.1 computers on the Nexus system. The way in which RISC OS 2 computers behave may differ slightly.

Structure

This manual is divided into four sections:

- Overview
- Installing the software
- Using the system
- Appendices

Overview

This section gives a general overview of the Nexus shared printing system.

Installing the software

This section covers how to copy and configure the software contained on the release floppy discs.

Using the system

This section covers how to use the shared printing system from the users' and manager's points of view.

Appendices

These give information of a more technical nature and also provide some useful hints and tips.

IMPORTANT

You must quit !Sharer before turning the key-switch on the disc sharer to Admin mode.

Contents

Section 1 Overview

1: Shared printing	2
Server and clients	2
Printer names	2
<i>Physical printers</i>	2
<i>Logical printers</i>	2
Styles of printing	3
<i>Spooled printing</i>	3
<i>Direct printing</i>	4
<i>Mixed printing</i>	4

Section 2 Installing the software

2: Installing !Sharer and the Banners directory	6
Copying the software	6
<i>!Sharer and Banners</i>	6
<i>Computer Concepts network drivers</i>	6
3: Configuring !Sharer	8
The print queue directory	8
<i>Location</i>	8
<i>Creating</i>	8
The banners directory	9
<i>Location</i>	9
Using a serial printer	9
Logical printer names	10
<i>The 'Printer' file</i>	11
<i>The 'Banner' and 'Endtext' files</i>	12
4: Configuring RISC OS printer drivers	15

5: Local drivers	16
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Section 3 Using the system

6: The client computers	18
Normal use	18
Displaying available printers	18
Printing from the command line or BASIC	18
Errors	19
7: The server computer	21
For the user	21
For the manager	22
<i>Printer control</i>	22
<i>Manipulating the print queue</i>	23
<i>The print sharer log</i>	25
<i>Quitting !Sharer</i>	26

Section 4 Appendices

A: Editing the !Boot application	28
Starting the !Sharer application automatically	29
Starting a printer driver automatically	29
Creating the print queue	29
Emptying the print queue.....	30
<i>LaserDirect</i>	30

B: Advanced use of banners	31
Flushing print jobs.....	31
<i>Epson compatibles</i>	31
<i>Hewlett-Packard DeskJet and LaserJet printers</i>	32
<i>Apple ImageWriter II printers</i>	32
<i>Monochrome Canon BubbleJet printers</i>	32
<i>Integrex printers</i>	32
<i>Computer Concepts LaserDirect printers</i>	32
<i>PostScript</i>	32
The Null and Hold banners	32
C: Non-compliant RISC OS printing	33
1st Word Plus	33
The PC Emulator	33
Pipedream	34
D: Tuning !Sharer	35
<i>System timeouts</i>	35
E: Testing printers and printer drivers	36
Check local printing	36
Check communication across the Nexus system	36
Check data received from the client is correct	36
<i>The format of print jobs</i>	36
<i>Checking the contents of a job</i>	37
F: Risc PC	39

Section 1 Overview

1: Shared printing

The Nexus printer sharer software is designed to allow an Archimedes computer to share its printers with other Archimedes computers attached to the same Nexus disc sharer. The printers can be any combination of parallel, serial or LaserDirect.

Server and clients

The Archimedes computer with the printer(s) attached is called the *server* and runs a multi-tasking application, *!Sharer*. The other computers on the cluster are called *clients* and access the printers on the server computer using the normal RISC OS printer drivers, although these will need to be configured appropriately.

Note: It is only possible to run one copy of !Sharer in a Nexus cluster. If you have several Nexus clusters interconnected by hub-hub links then it is not possible for Archimedes to access a printer using !Sharer via a Hub-Hub link, although this can be done using an Econet spooler such as Acorn's !Spooler or SJ Research's !PrintJnnr or !PrintServ.

Printer names

Physical printers

The printers attached to the server computer are called *physical* printers. The system manager allocates each physical printer with one or more *logical* printer name. Users will normally select which printer they want to use simply by loading an appropriately configured printer driver.

By choosing sensible logical printer names the system manager can make the printing system very intuitive and simple to use.

Logical printers

When users send print data to the server Archimedes, the server uses the selected logical printer name to decide which physical printer to send the data to. The data provided by the user is sent to the printer sandwiched between any *bannertext* and *endtext* specified by the system manager. The data sent by the user is called a *print job*.

Bannertext and endtext allow the system manager to top and tail users' print jobs with useful information such as the time and date

the job was printed or to send control codes to the printer to select different printing modes automatically, e.g. to select NLQ (near letter quality). They can also be used to improve the sharer's recovery from error conditions.

The purpose of allowing each physical printer to have more than one logical name is so the system manager can set up different bannertext, endtext or styles of printing for the same physical printer. For example an parallel printer could be set up with three names; NLQ, French and Small with the three different bannertext files automatically sending the correct control codes to set the printer into Near Letter Quality, French character set and condensed modes respectively.

Styles of printing

Spooled printing

When a printer is being shared by several computers there has to be a strategy to cope with the situation of several computers trying to print at the same time. The normal way to handle this situation is for the serving computer to implement a *Print Queue*. Print jobs sent by the client computers are not sent to the printer immediately, rather they are stored in a directory on disc. A print job is only sent to the printer once the user has finished sending it. This approach has several advantages:

Convenience	When users print, !Sharer stores their job in a file in the print queue directory. It is possible for the !Sharer software to accept print jobs from many stations at the same time. This means that users can always print, even if the printer is currently printing something for someone else. A user's job will be stored in the print queue and will be sent to the printer when it becomes free.
Speed	Even if the printer is busy, the server can accept the user's job and store it in the print queue. For the user this means that the process of printing can be much faster than if they were actually attached to the printer themselves. Of course, they do not actually get their printed pages any faster, however they do regain the use of their

computer much sooner so they can be getting on with other useful work.

Control

The !Sharer software allows the print jobs stored in the print queue to be viewed and manipulated by someone working at the sharer station. Jobs can be aborted, suspended or have their position in the queue altered.

Direct printing

Direct printing means that a job sent by the client is sent directly to the printer without first being written to a file in the print queue directory. This means that, as perceived by the user, printing will be slower and it will not be possible for several users to print at the same time. If the printer is busy then another user trying to print will get an error.

This style of printing is an advantage with printers such as plotters where the paper needs to be changed between every print job. It can also sometimes be simpler for users to understand. They can print when the printer is free but not otherwise and if they are printing then it will be their work coming out on the printer rather than someone else's.

Mixed printing

This style of printing is a hybrid of spooled and direct printing. If a logical printer is mixed then when a user sends a print job it will be sent directly to the printer if it is free and spooled to the print queue if not. In general we recommend that you use either spooled or direct printing in preference to mixed printing.

Section 2

Installing the software

2: Installing !Sharer and the Banners directory

By convention software specifically written for Nexus should be placed in the directory \$.Nexus on the drive 4 of the disc sharer.

Copying the software

The Nexus Printer Sharer software is supplied on two discs:

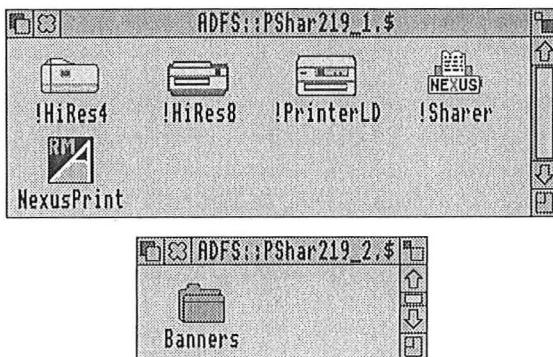


Figure 1: The Nexus printer sharer release discs

!Sharer and Banners

Delete your existing NexusPrint (if there is one) from \$.!Boot.Modules, and copy the one from the *Printer Sharer disc 1* into \$.!Boot.Modules. Copy the !Sharer application from the *Printer Sharer disc 1* to the \$.Nexus directory on drive 4 of the disc sharer. Create a directory called Banners inside \$.Nexus and copy the *relevant banners only* into this directory from the Banners directory on the *Printer Sharer disc 2*. Appendix B gives more information on the banners supplied. Work through the next section, *Configuring !Sharer*, before turning the disc sharer back into secure mode.

Computer Concepts network drivers

In order to drive Computer Concepts LaserDirect printers over a network you need special versions of the printer driver for running in the client stations. The *Printer Sharer disc 1* contains network drivers for the three types of LaserDirect printer. If you have a LaserDirect then you should copy the relevant network printer driver from the release floppy disc to wherever you store printer drivers on the

Nexus drive 4; by convention this is \$.!Apps._Printers.

If you are intending to use a LaserDirect printer over the network then the Archimedes running !Sharer must be an ARM3 based computer such as the A5000. We also recommend that it should have 4Mb of RAM.

3: Configuring !Sharer

The !Sharer application uses two directories while running; a print queue directory where spooled jobs are queued prior to printing and a banners directory in which the sub-directories define the names of logical printers.

The print queue directory

Location

The !Sharer program accepts print jobs from clients and stores it in a print queue directory. Where possible this should be on a local hard disc, but could be on the Nexus drive 5. The location of the print queue directory can be changed by running !Sharer and then selecting the 'Setup⇒General' menu option. Enter the location of the print queue, or drag the print queue directory to the print queue writable icon, and then click the 'Save' button. If you have dragged a print queue directory which is on a Nexus drive 5 then you may wish to edit the dragged name, substituting :5 for the :<disc name>. The change will come in to effect the next time !Sharer is loaded. Clearly, the print queue must be on a disc which is read/write.

Note: When you load !Sharer for the first time in order to configure it you may get two errors saying that it is unable to access banners and the print queue. This is simply a consequence of it not having been configured correctly at this stage.

Creating

Make sure that you create the directory that !Sharer will be using as a print queue. This directory is normally called 'PrintQ'. !Sharer will generate an error when it is started if it cannot find this directory.

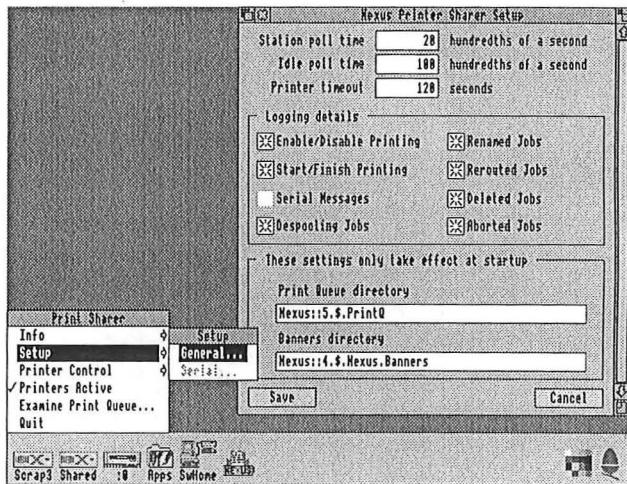


Figure 2: The 'Sharer Setup' window

The banners directory

Location

The !Sharer program uses the names of directories in the banners directory to determine the name and type of logical printers. As this information only needs to be read, it will normally be placed on the Nexus drive 4, by convention in the \$.Nexus directory alongside the !Sharer application itself. The location of the banners directory can be changed by running !Sharer and then selecting the 'Setup⇒General' menu option. Enter the location of the banners directory, or drag the banners directory to the banners writable icon, and then click the 'Save' button. The change will come in to effect the next time !Sharer is loaded.

Using a serial printer

If you are intending to share a serial printer then you will need to configure !Sharer with the appropriate serial settings for your printer. This can only be done if you have set up a Banner directory which refers to a serial printer.

The serial settings can be changed by running !Sharer and then selecting the 'Setup⇒Serial' menu option, clicking 'SELECT' over the appropriate arrow and then choosing from the list of options displayed. You then need to click the 'Save' button. Any changes will come in to effect the next time !Sharer is loaded.

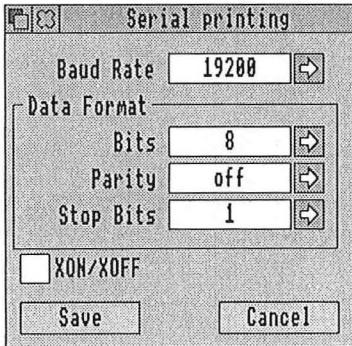


Figure 3: Configuring the serial settings

Logical printer names

The contents of the Banners directory determines the names of logical printers available across the Nexus cluster. The Nexus printer sharer software is supplied with some logical printer names setup ready to use. If you wish you can use these to test the system and leave setting up your own printer names until later.

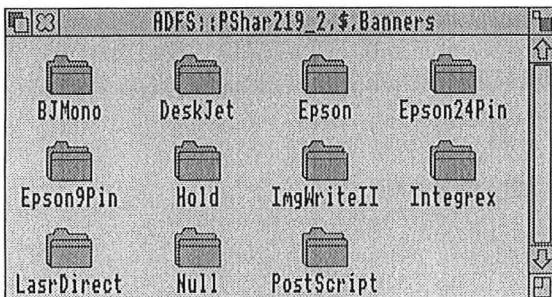


Figure 4: The default logical printer names

If you want to have different printer names then you can simply rename one of the directories. If you want to add a printer name then we recommend you copy one of the existing banners.

Inside each directory there must be a textfile 'Printer' which is used to define to which physical printer jobs sent to this printer name should be directed, i.e. parallel port, serial port or LaserDirect. In addition there may also be files *Banner* and *Endtext* which define how the job should be topped and tailed.

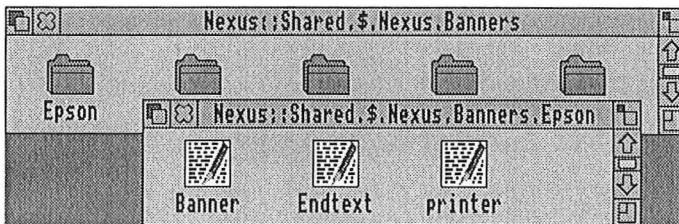


Figure 5: The contents of a sub-directory in the banners directory

All of the files are textfiles and so can be edited using !Edit.

The 'Printer' file

The Printer file must exist as it defines the physical printer for output and the type of printing. **They must be defined in that order.**

The physical printer may be one of the following:

- <PARALLEL> The printer attached to the printer sharer's parallel port.
- <SERIAL> The printer attached to the printer sharer's serial port.
- <LASERDIRECT> A Computer Concepts Laser Direct printer. This printer must have printing type <SPOOL>.

There are two further types which can be useful in some circumstances and for debugging purposes.

- <HOLD> The job is spooled but not printed until rerouted to a different logical printer name. This printer must have printing type <SPOOL>.
- <NULL> The job is sent to the Archimedes *Null*: device and then deleted.

If, when the !Sharer application starts up, a logical printer is discovered which is not defined as one of the above then it will give the error message 'Bad device for banner <bannername>' where <bannername> is the name of the illegally defined logical printer.

The type of printing may be one of the following:

- | | |
|----------|--|
| <SPOOL> | Jobs will be queued for printing in the order the !Sharer software receives them. |
| <DIRECT> | Jobs will be sent straight to the printer if it is not busy, otherwise the user will be sent an error. |
| <MIXED> | Jobs will be printed directly if the printer is free and spooled otherwise. |

If the type specified is not one of the above then when the !Sharer application starts up it will discard this logical printer name and give the error 'Bad spooling type for banner <bannername>'.

The 'Banner' and 'Endtext' files

These file contain the text and printer control codes to print before and after print jobs. The files can consist of mixed text, control codes and keywords. Control codes are the normal Archimedes "barcodes", i.e. !A for Ctrl-A (character code 01), and so on; !? is used for DEL (code 127) and !! is used to set the top bit on the following character. The characters !, < and > are represented by ||, |< and |>.

Note: You may need to be careful when using banner and endtext files which contain text for printing. This is because the RISC OS printer driver running in the client computer may keep its own idea of how far advanced the paper is through the printer. If the printing of a banner advances the print head then the head is no longer in the position expected by the RISC OS printer driver. This can lead to a print job, in particular any page breaks, being printed in the wrong place. If you experience this problem then edit the banner and endtext files so that they do not contain any printable text.

The full list of keywords for use in banner and endtext files is:

<NOW>	Selects the time of processing the job for the time and date keywords below.
<START>	Selects the time that the user initiated printing.
<END>	Selects the time that the user finished sending characters for printing.
<HOURS>	Replaced to hold the hours (two digit 24 hour clock, leading zero printed).
<H>	A synonym for <HOURS>.
<12HOURS>	Replaced to hold the hours (two digit 12 hour clock, leading zero replaced with a space).
<AM>	Replaced with either a.m. or p.m. as appropriate
<MINUTES>	Replaced to hold the minutes (two digits, leading zero printed).
<M>	A synonym for <MINUTES>.
<SECONDS>	Replaced to hold the seconds (two digits, leading zero printed).
<S>	A synonym for <SECONDS>.
<DATE>	Replaced to hold the day of the month (two digits, leading zero replaced with a space).
<ST>	Replaced to hold the correct suffix for the day of the month.
<MONTH>	Replaced to hold the month (two digits, with the leading zero printed).
<MONTHNAME>	Replaced to hold the full name of the month, e.g. January.
<MTH>	Replaced to hold the three letter abbreviation of the month.
<YEAR>	Replaced to hold the year (i.e. 93 for 1993)
<FULLYEAR>	Replaced to hold all four digits of the year, e.g. 1993
<USERNAME>	Included for compatibility with MDFS banner files; replaced with nothing.

<STATION>	In previous versions this gave the client's Nexus port number. On Nexus network systems it gives a number in the range 1 to 12, but a particular station will not always give the same number.
<MARK>	Gives a reference point for <TAB>
<TAB nnn>	Pads out to nnn spaces after the last <MARK>. There must be only one space between the word TAB and the number. If no <MARK> has been given, this pads out to nnn spaces from the beginning of the text. If the number after TAB is less than the current character position, then the tab will move to the position 256+nnn.

Note the use of < and > to surround any keyword.

Note: The time information is taken from the system clock in the Archimedes running the !Sharer application. If the Archimedes time is set incorrectly then the information printed in a banner or endtext file will also be wrong.

4: Configuring RISC OS printer drivers

Printing across a Nexus system is done by configuring the printer driver to print to a special file. Changing the destination of the output from the printer driver will go is done from the 'Printer control' menu.

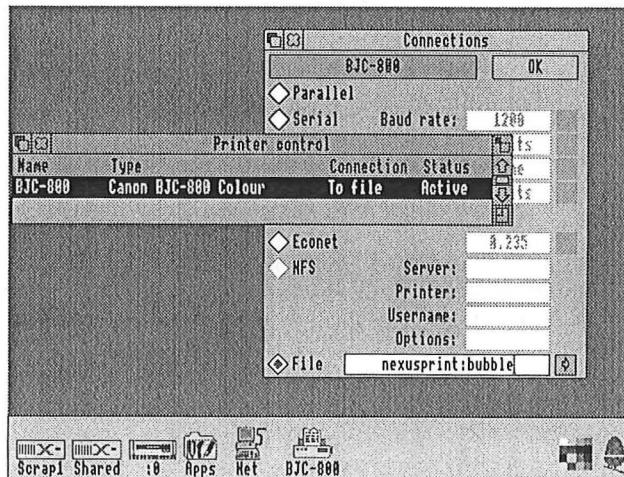


Figure 6: Configuring printer output to go to the 'bubble' nexus printer sharer

The syntax of the file name you enter is:

```
NexusPrint:<logical printer name>
```

where <logical printer name> is the name of one of the entries in the Banners directory.

Having configured the printer driver you should then save the setup so that it becomes the default. Clearly, changing the default printer driver setup must be done from the management computer when the sharer is in 'Admin' mode.

Note: On RISC OS 2 printer drivers use the 'To file:' option from the main printer driver menu on the icon bar. Once again, remember to save the settings.

5: Local drivers

If you want to print from the computer which is running !Sharer then the printer drivers loaded by that computer clearly need to be configured to print locally rather than across the network. We recommend that you store a separate copy of the printer driver, configured to print locally, in the \$.Nexus directory for use by the computer running !Sharer.

Note that output from !Sharer has to be temporarily disabled (using the 'Printers Active' menu option) before you can print locally from the !Sharer computer.

In the case of Computer Concepts LaserDirect drivers the \$.Nexus directory should contain a copy of the driver supplied by Computer Concepts. The network version of the LaserDirect driver as supplied by SJ Research on the Printer Sharer release disc 1 cannot be used for printing locally.

Section 3

Using the system

6: The client computers

Before the Nexus printer sharing system will work you must be running !Sharer on the computer with the printers attached.

Normal use

Under normal circumstance users will simply load a printer driver that has already been configured by the system manager. They will then print in the usual way.

Displaying available printers

A user can display information about printers which are being shared on a Nexus cluster, together with status information by typing:

*NexusPrinters

This will return output similar to that below:

Nexus Printer Sharer User 2		
Epson	Parallel	direct, in use by despooler
EpsonNoBan	Parallel	mixed, in use by despooler
LasrDirect	LaserDirect	spooling
PostScript	Serial	spooling
Hold	Hold	spooling

Printing from the command line or BASIC

Most applications will send output to a printer using the standard RISC OS printer drivers. However, some older packages which are not RISC OS compliant may need to be reconfigured or edited in order to access printers via a Nexus system. Sending printer output to a Nexus printer is done using two commands:

*FX 5,8

to send output to via the Nexus system and

*NexusPS <logical printer name>

to select which logical printer to use.

The current setting setting of NexusPS can be found by typing

*NexusPS without a logical printer name.

Alternatively the system variable PrinterType\$8 can be changed by using the command:

```
*Set PrinterType$8 <setting>
```

where <setting> is what you would normally fill in against the 'To file:' option of a printer driver, e.g. NexusPrint:Epson.

If the setting of PrinterType\$8 is anything other than *nexusprint*: then this will override the effect of a NexusPS command.

Errors

If a client computer is unable to print then an error box similar to the one below will appear:

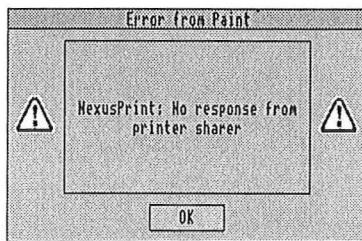


Figure 7: Printing error

These could be caused for a variety of reasons:

NexusPrint: Printer sharer not available

The server is not running !Sharer

Clearly if the server computer is not running the !Sharer application then clients will be unable to send print jobs.

NexusPrint: No response from printer sharer

The server is not multi-tasking within the desktop

If the server computer is not running multi-tasking software then the !Sharer application will be unable to process jobs from clients.

NexusPrint: Printer sharer disc full

The disc holding the print queue directory has become full

When the disc holding the print queue directory becomes full the !Sharer application will no longer be able to spool jobs to the print queue.

NexusPrint: Banner not known

The printer has been disabled or doesn't exist

Logical printer names can be disabled from !Sharer's 'Printer Control' sub-menu. Under these circumstances the server computer will not accept any more new jobs sent to this logical printer.

7: The server computer

The server computer may be used by an ordinary user wanting to print, or by the system manager wanting to manipulate the print queue or control the print sharing system in some way.

For the user

When !Sharer is running normally it claims the printer ports (parallel and/or serial) it requires. It is then not possible for a normal RISC OS print driver to print to the claimed port(s). If you try to print locally the error message you get will probably be one of the two below:

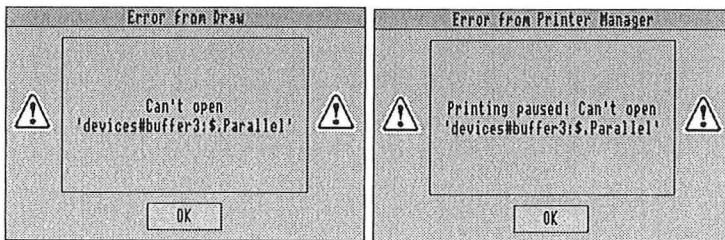


Figure 8: Some printing errors

Which error you get will vary from application to application depending on the method it uses to communicate with the printer driver. Notice that in the second example the printing has been 'Paused'. Printing can be resumed by selecting the 'Resume' menu option from within the printer driver's 'Queue control' window (Risc OS 3 !Printers only).

When a user wants to print they should first menu on the !Sharer icon and select the 'Printers Active' option. Once any jobs currently printing have been completed the icon on the icon bar will change to have a red cross through it. The log window shows whether printers are active or not.

Note: If you have any serial banners you also need to use the 'Printers Active' option to disable !Sharer before using any software which makes use of the serial port. In particular this applies to the A-Link software used for communicating with the Acorn Pocket book. In this version of !Sharer it is no longer necessary to disable printers if you have no serial banners.



Figure 9: Deactivating !Sharer

When the icon is crossed in this way !Sharer has released the parallel and serial ports and will not attempt to send any more jobs out on these ports. This will allow the RISC OS printer driver to function normally. When !Sharer is deactivated in this way it will still accept spooled print jobs from clients so other users of the system will not normally be affected.

When the user has finished printing locally he should remember to reactivate !Sharer so that spooled jobs can once again be printed.

For the manager

The system manager will normally want to use the server computer to either manipulate the jobs in the print queue or to control the printers in some way.

Printer control

The 'Printer Control' menu option allows the manager to selectively control which physical or logical printers users may access. A logical printer name or printer type is enabled if it has a tick to the left of its name in the menu. If there is no tick or if it is greyed out then it is disabled. Once a job has begun printing, deselecting it using this menu option does not affect it. However, no new jobs will be accepted. This enables system managers to shut down !Sharer without stopping any partially completed jobs, perhaps as a preliminary to deactivating the printers or quitting !Sharer altogether. Another use of this feature is to halt printing to in order to service a printer, allowing the manager to change its ink cartridge or refill it with paper.

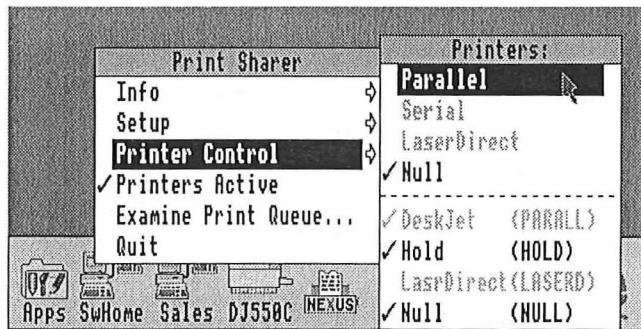


Figure 10: Disabling the printer on the parallel port

Manipulating the print queue

The 'Examine Print Queue...' menu option opens a window displaying the contents of the print queue directory, or by 'ADJUST' clicking the !Sharer icon on the icon bar. Once the window is open it will be updated automatically whenever a new job is accepted or when a job is deleted having been successfully sent to a printer.

Nexus Print Sharer Queue						
aa88	DeskJet	Stn 1	196	12:31:03	22 Jun 1994	Printing
aa81	DeskJet	Stn 1	8k	12:31:52	22 Jun 1994	Waiting
aa82	Hold	Stn 1	8k	12:32:38	22 Jun 1994	Waiting
aa83	Hold	Stn 1	8k	12:32:52	22 Jun 1994	Waiting

Figure 11: Examining the print queue

Inside the queue window the information shown is:

<Printer icon><Job name><Logical printer name><Station><Time><State>

- | | |
|-----------------|---|
| Printer icon | This indicates the physical printer that the job is destined for. |
| Job name | This is the directory name within the print queue which hold information for the print job. |
| Logical printer | This is the name of the logical printer to which the job was sent. |

Station	This is the number of the station that sent the job. <i>Note: On Nexus networking the printing station number is arbitrary.</i>
Time	This is the date and time at which the job was sent.
State	This shows the current status of the job (spooling, printing or waiting).

Jobs which have a grey icon cannot be selected and manipulated because they are either *printing*, i.e. they are currently being output to the printer, or they are *spooling*, i.e. the client is still in the process of sending data.

While a file is *waiting* to be printed, either because its printer has been disabled or because another job is already being sent to its printer, it may be selected in the same manner as in a filer window. The selected job can then be manipulated in several ways:

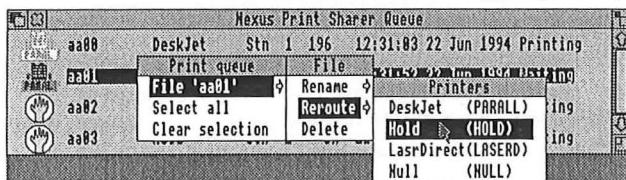


Figure 12: Selecting a print job for manipulation

Rename	Jobs in the print queue are printed out in strict alphabetical order. Altering the priority of a job so that it is printed out earlier or later is simply a matter of renaming it to an appropriate name. The !Sharer application allocates job names starting from 'aa00' but is possible to use any legal Archimedes name when renaming a job. The '!' character is alphabetically before 'a' so renaming a job to something starting with a '!' is a good way of moving a job to the top of the queue.
--------	---

Reroute

Rerouting means changing the logical printer that the job is destined for. This option is normally used when a job has been sent to a 'hold' printer. Hold may be because the user wants to send the job to the server but does not want it printed yet, perhaps because he wants to print on OHP film rather than paper. Once the OHP film has been loaded he will reroute the job to an active printer.

When rerouting files to different printers bear in mind that !Sharer will not alter the contents of the job: a job intended for an Epson printer would not make much sense if rerouted to a PostScript printer.

Delete

This option can be used to delete a print job from the print queue.

The 'Reroute' and 'Delete' options can be applied to a multiple selection of print jobs.

The print sharer log

You can open the 'Nexus Print Sharer Log' window by clicking 'SELECT' on the !Sharer icon on the icon bar.

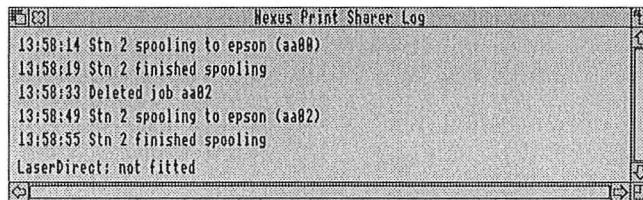


Figure 13: The 'Nexus Print Sharer Log' window

This window gives a log showing how !Sharer is processing jobs. It is possible to configure which actions are logged, see *Appendix D* for more information on how to do this.

Quitting !Sharer

The !Sharer application should always be closed down properly by selecting the 'Quit' menu option. If appropriate, you will get a warning pop-up indicating that !Sharer is currently processing jobs.

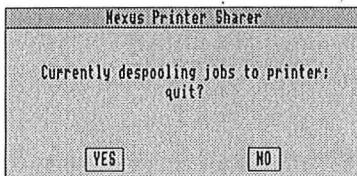


Figure 14: Warning pop-up when quitting !Sharer

Section 4 Appendices

A: Editing the !Boot application

To make the Nexus printing system as user-friendly as possible it is worth editing the !Boot application on the Nexus drive 4 so that the !Sharer application starts automatically on the required computer and all computers load an appropriate printer driver.

!Boot is a very powerful and useful application. The comments inside the application itself together with documentation on the Nexus Release Disc should make it clear to anyone well acquainted with RISC OS how its operates. Although it is fairly complex, no programming expertise is needed to customise it to managers' precise requirements.

You can see the contents of the !Boot application by double-clicking on it whilst holding down the <SHIFT> key.

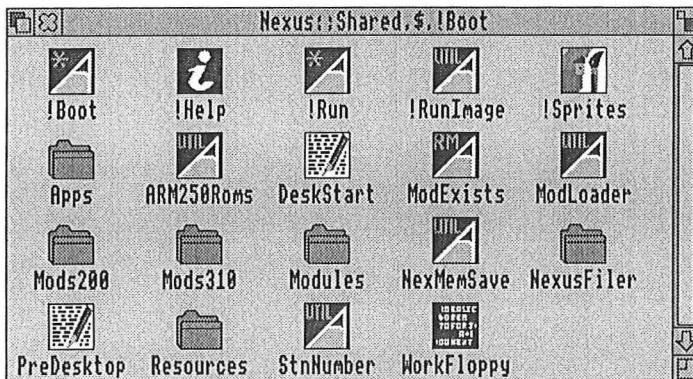


Figure 15: The contents of the !Boot application

The behaviour of the !Boot application is determined by the contents of the two text files 'PreDesktop' and 'DeskStart'. These can both be edited using !Edit.

- | | |
|------------|---|
| PreDesktop | Unless you are familiar with RISC OS you should not attempt to edit this file. |
| DeskStart | Even if you are unfamiliar with RISC OS it is straightforward to add your own commands to the end of this file to load applications, printer drivers etc. automatically. This file is extensively commented to help you understand its operation. |

Starting the !Sharer application automatically

The DeskStart file already has a line for starting the !Sharer application, but it is commented out.

```
If Nexus$Station = 64 Then Run <Boot$Disc>.Nexus.!Sharer
```

All you need do is the remove the '!' comment character from the front of the line and replace the '64' with the station number on your system on which you want to start !Sharer automatically. If you are not sure what the station number of your printer sharer computer is then press F12 and type:

```
*Show Nexus$Station
```

and this will display the station number.

Starting a printer driver automatically

Remember that the server needs to run a printer driver which is configured to print locally while the clients need to run a driver configured to print via the Nexus system. By convention the driver configured to print locally resides in '\$.Nexus' and the driver configured to print via the Nexus system resides in '\$.!Apps._.Printers'.

You can start up the appropriate driver by adding a *single* line to the bottom of the DeskStart file like the one below:

```
If Nexus$Station = 64 Then  
Run <Boot$Disc>.Nexus.!Printers Else  
Run <Boot$Disc>.!Apps._.Printers.!Printers
```

Creating the print queue

Because the print queue directory must be on a disc which is read/write it is possible that someone using the printer server computer might accidentally delete it. Under these circumstances the !Sharer application will give an error 'Unable to access the print queue directory' and will not accept any print jobs.

To avoid this situation you can add a line to the DeskStart file, before the line which starts !Sharer, like the one below.

```
Cdir ADFS::4.$.Nexus.PrintQ
```

Emptying the print queue

Some system managers like to set up the system so that whenever the computer running !Sharer is reset all the jobs in the print queue are deleted. This gives a very simple strategy for recovering from difficult situations like the print queue being filled with duplicate jobs or jobs which users have sent to the wrong printer.

The print queue can be emptied by adding a *single* line, before the one which starts the !Sharer application. For example, if your print queue is held in ADFS::4.\$.Nexus.PrintQ, the following line is be appropriate:

 IfExists ADFS::4.\$.Nexus.PrintQ.* Then
Wipe ADFS::4.\$.Nexus.PrintQ.* ~sc~vfr

LaserDirect

If a user aborts a print job being sent to a LaserDirect printer then, when !Sharer submits the incomplete job to the printer, the printer may reject the job and send a message to that effect back to the !Sharer application. Under these circumstances the !Sharer application will automatically reroute the job to a logical printer name of 'BadLaser'. The job will then remain in the print queue until deleted or rerouted elsewhere. If you wish you can create a logical printer name of 'BadLaser' with the <NULL> printer type. This will means that 'BadLaser' jobs will be automatically removed from the print queue.

 Occasionally jobs sent to a Computer Concepts LaserDirect printer can cause the Archimedes to hang. Under these circumstances the !Sharer application never gets a chance to delete the print job. If the print queue is not emptied, either manually or by editing the !Boot application as above, then when the !Sharer software is restarted the offending job is sent to the LaserDirect again and the computer hangs again. If you are using a LaserDirect printer and your printer sharer station "hangs" whenever it is powered up this may be the cause. Try powering it up with the LaserDirect printer switched off and clearing the print queue before switching on the LaserDirect.

B: Advanced use of banners

The 'Banner' and 'Endtext' files are a very useful facility of the Nexus print sharing system. Their ability to send control codes to printers is a powerful feature allowing the printer to be put into a given setup automatically.

On any shared printing system there are a variety of problems that can occur.

- When printing locally, if a user aborts a job half way through then probably the next thing they will do is turn off the printer and feed the paper on to the top of page. In the shared printing environment this is unlikely to be possible, and if another job is queued up it will start with the paper set in the wrong place.
- Most RISC OS print drivers use a printer's graphics mode in order to print the RISC OS outline fonts. If a job is aborted in the middle of sending a long graphics command then the start of the user's print job will be misinterpreted as the end of the last user's graphics command, which can lead to all sorts of strange output on the printer.
- If a user sends commands to the printer, to select font style or size, then these setting will continue on for the next print job.

Flushing print jobs

Flushing a print job means ensuring that the endtext for a logical printer name contains the correct printer codes to correctly terminate any aborted job. The second release disc contains banners with the correct endtext files for all common printers, if you do not recognise your printer, or wish to create a new endtext, please contact the Technical Support Desk at SJ Research.

Epson compatibles

For Epson compatible printers (which include the Epson Stylus series inkjets, and the colour Canon bubblejets) use the supplied Epson banner. We recommend that you only use Epson24pin or Epson9pin (if they are appropriate) if your printer seems very slow at finishing jobs.

Hewlett-Packard DeskJet and LaserJet printers

N.B. If your LaserJet printer is PostScript type (e.g. a LaserJet 4M), refer to the PostScript section.

Use the supplied DeskJet banner. If your printer is a LaserJet, you may wish to rename the banner.

Apple ImageWriter II printers

Use the supplied ImgWriteII banner.

Monochrome Canon BubbleJet printers

Use the supplied BJMono banner. This banner can also be used with IBM type printers (e.g. IBM ProPrinter-X24e).

Integrex printers

Use the supplied Integrex banner.

Computer Concepts LaserDirect printers

Use the supplied LasrDirect banner.

PostScript

Use the supplied PostScript banner.

PLEASE NOTE

All the supplied banners are configured for use with the parallel port (except LaserDirect which is configured for direct use). If you wish to use them with the serial port, edit the Printer file inside them, changing <PARALLEL> to <SERIAL>.

The Null and Hold banners

These banners print to the null and hold devices respectively. Null throws away all printout directed at it. Hold keeps print jobs in the queue until they are rerouted or deleted.

C: Non-compliant RISC OS printing

1st Word Plus

The 1stWord+ software can output to only three possible ports – parallel, serial and network. The network port is intended for use with Econet networks but it is possible to direct the output to go across a Nexus system instead.

The Econet destination for print jobs is determined by the setting of the system variable *PrinterType\$4*. This would normally be set to something starting with NetPrint, indicating that the job is to be sent across the Econet network. By changing the setting of *PrinterType\$4* to an option starting with NexusPrint you can redirect the print job across the Nexus system. For example

```
*Set PrinterType$4 NexusPrint: Epson
```

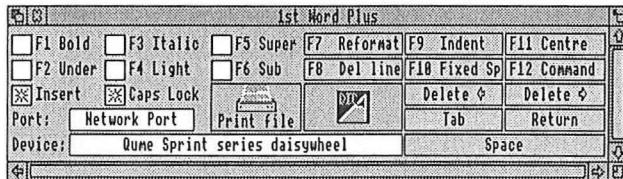


Figure 15: The 1st Word Plus keypad

The PC Emulator

The PC Emulator does not handle any shared printing system elegantly. When print jobs are sent to either of the PC printer devices LPT1 or PRN then RISC OS will direct the output as instructed by the setting of the system variable *PrinterType\$1*. If you set *PrinterType\$1* to an option starting with NexusPrint then you can redirect the print job across the Nexus system.

One strange aspect of the PC Emulator is that a print job is not actually finished until you quit the emulator. If you print from a PC package then you may see the job arriving in the print queue but it will not actually be printed out until such time as the user quits the PC Emulator.

Pipedream

Pipedream will print using the standard RISC OS printer drivers but also has the option to use its own printer drivers. Pipedream's own drivers have the advantage of using a printer's internal font and so can output much faster than the RISC OS drivers.

To output from a Pipedream driver across the Nexus system you need to select 'User' as the printer type and also set the value of the system variable PrinterType\$3 as below:

```
*Set PrinterType$3 NexusPrint:
```

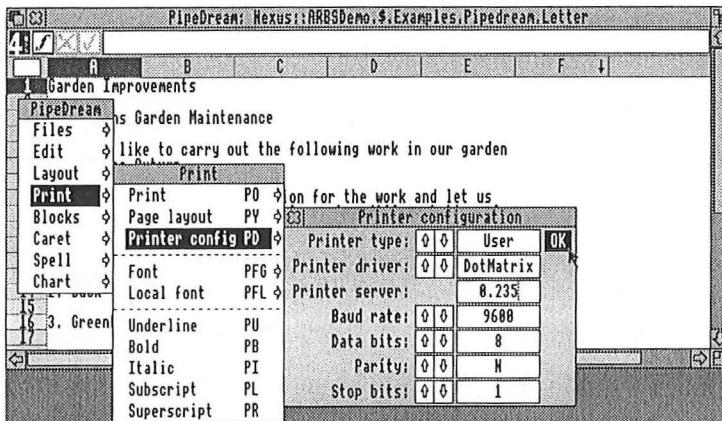


Figure 16: Configuring a Pipedream driver

D: Tuning !Sharer

Selecting the !Sharer 'Setup⇒General' menu option allows you to alter the level of logging and also the printing system's timeouts.

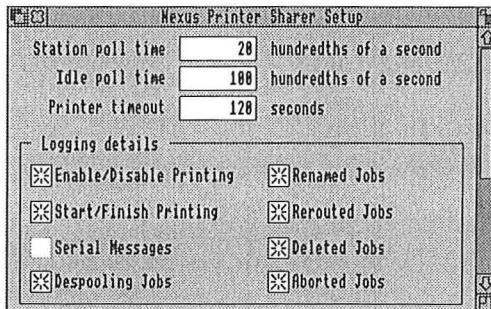


Figure 17: The 'Nexus Printer Sharer Setup' window

System timeouts

The !Sharer application works by polling a reserved area of the Nexus disc, called the *print buffer*, looking for messages sent from computers trying to print and responding to them appropriately. When !Sharer is idle it scans the print buffer at a rate determined by the 'Idle poll time'. If it detects a message then it switches to scanning at a faster rate determined by the 'Station poll time'.

Station poll time This determines the rate at which !Sharer scans for data once it has detected that a user has started to submit a print job. This is generally set to quite a short time so that data from clients is accepted quickly.

Idle poll time This determines the rate at which !Sharer scans to detect a print job being started.

Printer timeout This determines the length of time that !Sharer will wait for a printer to respond when a station is printing directly, before assuming that the printer has failed in some way and aborting the job. This is normally set to a high value, 2 minutes by default, since some printers such as PostScript printers can take a long time to process data.

E: Testing printers and printer drivers

It is important to realise that the printer server computer running !Sharer is simply acting like a very intelligent printer switch. It has no knowledge of what the data sent by the printer driver running in a client computer actually means. The data produced by the client's printer driver is simply passed through to the relevant printer port.

If you seem to be having trouble printing then try the following ideas:

Check local printing

On the server computer do *not* run !Sharer but simply use a standard RISC OS printer driver configured to print directly to the appropriate printer port. This will identify problems which are actually due to software bugs in the printer driver or the application from which you are printing. It can also help identify hardware problems such as a broken printer, printer lead or printer port on the computer.

Check communication across the Nexus system

The Nexus print sharer software is supplied with a logical printer name of 'Hold' already setup. Jobs sent to this printer name will simply remain in the print queue until rerouted to a different name. By configuring the client computer's RISC OS printer driver to send to the NexusPrint:Hold printer you can test that information is actually passing correctly across the Nexus system.

Check data received from the client is correct

By manually opening the print queue directory you can examine a print job in detail.

The format of print jobs

Print jobs are given names consisting of two letters and two digits, starting from 'aa00', 'aa01' and so on up to 'zz99'. These are the names of directories within the print queue directory which will contain files containing all the information relevant to a job. If a job is spooled then the directory will store the data to print, while for direct printing it is used as workspace for creating the banner texts.

A print job directory contains up to four files, depending on whether it is created for spooled or direct printing.

Job	This file contains the data submitted by the user for sending to the printer. It is only created for spooled jobs.
Header	This file contains the name of the logical printer to use, the times of submitting the print job, the station number of the station the job came from and sundry other information used when processing 'Banner' and 'Endtext' files.
Banner	This is only present when data is being despoled or printed directly and contains the banner text with all the keywords substituted to their correct values.
Endtext	This is only present when data is being despoled or printed directly and contains the endtext with all the keywords substituted to their correct values.

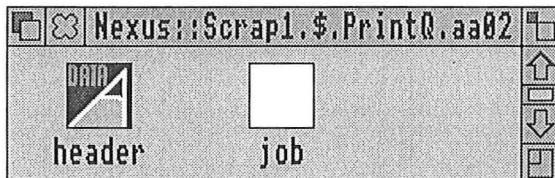


Figure 18: The contents of a print job directory

Checking the contents of a job

The data held in a 'job' file should be identical to that produced by the client's RISC OS print driver if the output is sent to a real file on disc. The only difference will be that the 'job' in the print queue will not have the correct file type.

You can check the contents of the 'job' file by following the procedure below:

- Quit the !Sharer application.
- Load the appropriate RISC OS printer driver configured to print locally.

- Set the filetype of the 'job' file correctly, to PoScript for PostScript jobs, and to PrintOut for all other types of job.
- Drag the 'job' file and drop it on the printer driver icon on the icon bar.

If you find that the first part of the job prints correctly but then things go wrong this suggests a handshaking problem between the computer and the printer. Handshaking is a protocol used by the printer to inform the computer that its printer buffer is full up and not to send any more data for a while. When printing locally the print buffer rarely, if ever, fills up. This is because the time it takes a RISC OS printer driver to calculate the next chunk of data to send to the printer is usually well matched to the length of time it takes the printer to print the last chunk. However, the !Sharer application has no calculating to do, as it has all been done by the client already. This means that the server computer can send data to the printer much faster than the printer can print it, thus provoking the handshaking protocol. If the printer or computer are configured incorrectly, or if the handshaking line in the printer cable is damaged, this can cause the problem described above.

F: Risc PC

The Nexus Printer Sharer system works correctly on Risc PCs, with the Risc PC as either a client or a server. However you cannot use LaserDirect printers with a Risc PC, either as a client or a server. On an Risc PC, !Sharer will not use the FastParallel device, so you are restricted to the Parallel device. For more information please contact the Technical Support Desk at SJ Research.

